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(54) Title: OIL- AND POWDER-COATED RAW RICE AND METHODS FOR THE PREPARATION THEREOF

(57) Abstract: The invention relates to raw rice products coated with oil/fat and comprising powdered food components or mixtures thereof on the surface of the grains. Optionally, the rice products of the invention also comprise pieces or slices of dried vegetable, fruit or meat. The invention also relates to methods for the preparation of the rice products of the invention. The rice product of the invention can be used for the fast and simple preparation of tasty rice dishes of high nutritive value.

OIL- AND POWDER-COATED RAW RICE AND METHODS FOR THE PREPARATION THEREOF

5 FIELD OF THE INVENTION

The invention relates to raw rice products coated with oil/fat and comprising powdered food components or mixtures thereof on the surface of the grains. The oil/fat used is preferably eating quality mineral oil and/or vegetable oil/fat. The invention also relates to processes for the preparation of the raw rice products of the invention, to the use of the rice products in multicomponent ready-to-use dish/meal compositions and to multicomponent, ready-to-use dish compositions.

The invention can be used for the preparation of tasty rice dishes, e.g. one-course dishes or fast rice garnishes of high nutritive value, supplied with natural food components derived from plants or animals .

15 BACKGROUND OF THE INVENTION

As used herein, "powdered food preparation" refers to a mass of particles, said particles having a diameter of less than 2000 μm , and said product being prepared by fine shredding, grinding and/or milling of a main food component. Optionally, said preparation also comprises other components, such as spices, flavors and additives which preferably increase the nutritive value of the product.

As used herein, the term "powdered food mixture" refers to powdered food preparations, which comprise two or more food components.

The commercially available, flavored, colored rice products of the art are mostly prepared from parboiled rice using a steaming technology where the flavoring or coloring coating components are applied in an aqueous medium. In another large group of ready-to-use rice products the flavoring and coloring components and the dried food components and extracts of plant or animal origin, are simply weighed out and packaged together with the raw or parboiled rice in the same packaging unit.

As starting material, the state of art processes based on rice parboiling technology require excellent quality rice. In these technologies the cooking and drying steps are expensive in terms of time and energy. The ratio of the crumbled (broken) grains in the end product is significant, therefore a subsequent separation step is required.

Other processes for treating the surface of rice are also known in the art and used in practice. In general, the aim of these processes is to polish the surface of the natural, husked, eating rice and to make it more aesthetic. For example, such polishing methods include the water spray polishing method
5 [Marshall, W. E. and Wadsworth J. I. „Rice Science and Technology 242-246 (1994)] and the partial or complete coating of the surface of rice with e.g. dried talc, talc-glucose syrup or glucose solution (see e.g. Bor S. Lun „Rice Production and Utilization” AVI Publishing Company Inc., Westport, Connecticut, USA).

Oil-polishing of cereals was performed on millet, as disclosed in Hungarian
10 patent No. HU 21551 (1901); however, because of the rapid rancidification of the edible oil used, prolonged storage of the end product was impossible.

A process for coating raw rice with nutritional supplements (vitamins, minerals, amino acids or other supplements) is disclosed in US Patent No. 4,765,996. In this process the vitamins, amino acids and various minerals are
15 applied to the surface of rice grains in a water-oil emulsion, using adhesives and relatively high temperatures.

US Patent No. 4,687,669 discloses a process in which nutritional supplements are applied to the surface of rice and barley by a conventional method in order to increase their nutritive value. In order to protect the added
20 nutrients, the enriched rice is coated with an aqueous emulsion of oil/fat and/or wax. The emulsion is applied in a warm, melted form, which solidifies when cooled down to room temperature.

In US Patent No. 4,767,636 a process for the preparation of dehydrated instant rice and sauce dish made of parboiled rice is taught. In this process the
25 coating is created by applying as many as three layers of oil to the surface of the rice. After the application of the first layer, consisting of a significant quantity of oil, spices and flavors are added. Only in the last step, after the addition of further two layers of oil, are the freeze-dried and/or puffed dried vegetables applied. However, this technology is rather complicated and expensive due to the use of large
30 quantities of oil and to the high energy consumption of the methods used for the preparation of the rice and vegetable starting materials.

Until recently, however, no fast and simple process was available for the coating of raw, preferably husked rice with essentially any mixtures of food powders and/or powdered, dried vegetables, at low cost. Consequently, no raw

rice product coated with mineral oil and/or vegetable oil/fat and comprising powdered food components or mixtures thereof on the surface of the grains was available. Thus, the object of the invention is to provide a new rice product, which satisfies the above outlined need, and a method for the preparation thereof.

5 DESCRIPTION OF THE INVENTION

The present invention is based on the unexpected discovery that, without using additives, a durable coating or coloring of powdered food preparations or food mixtures can be applied to the surface of the grains of raw, husked white rice or partially husked brown rice comprising at most 16% moisture, by coating the
10 untreated raw, husked or partially husked rice grains with oil/fat, and then sprinkling or dusting the low fat powdered preparation or mixture on the surface of the rotated and whirled rice grains, wherein the powdered preparation or mixture has a moisture content lower than that of the rice and and appropriate particle size. Preferably, the application of the powdered preparation or mixture is carried
15 out and the product is packaged under low humidity conditions, and an oil/fat unsusceptible to rancidity, i.e. which can be stored at least for several month, preferably for more than 6 months, is used.

It is known in the art that parboiled rice contains high amounts of hairline cracks on its surface, which is thereby increased. Most probably, this is why
20 application of large quantities of oil in US Patent No. 4,767,636 is required. Furthermore, it can be stated that before the present invention, a person skilled in the art did not use raw rice for the preparation of rice products supplemented with food components on the surface of the grains probably because he could not reasonably expect that a surprisingly large quantity of dry solids could be applied
25 using small quantities of adhered oil, provided that the circumstances disclosed herein are maintained.

Thus, the invention relates to a process for preparing a raw rice product coated with powdered food components said process comprising the steps of coating rice grains of at most 16% moisture content with eating quality mineral oil
30 and/or vegetable oil/fat, and applying a low fat powdered food preparation or mixture to the surface of the oil/fat-coated rice grains, wherein the food preparation or mixture has a moisture content lower than that of the rice and has an appropriate particle size.

Throughout the description, unless otherwise indicated, % means w/w%, and the ratios of the ingredients of the product are given in % by weight of the rice.

In a preferred embodiment of the invention the surface of raw, husked white rice or partially husked brown rice with at most 16% and at least about 9%,
5 preferably about 12% to about 15% moisture content is coated with at most 12%, preferably 7.5%, preferably less than 5%, more preferably 2.1 to 3% eating quality mineral oil and/or vegetable oil/fat or mixture thereof being unsusceptible to rancidity, then applying, depending on the thickness of the oil film layer, at most 20%, preferably about 10%, low fat powdered food mixture which has a moisture
10 content at most 10%, preferably at most 6% and a particle size of at most 2000 μm , preferably at most 1000 μm , more preferably less than 500 μm , most preferably less than 315 μm . The powdered preparation or mixture is considered as "low fat" if the fat content (including all its natural fat or oil content) is below 5%, preferably below 1%, more preferably below 0.5%.

15 The quantity of the applicable powder mixture depends on the thickness of the oil film layer. An about 12% oil content can take up about 20% powdered mixture, but a higher ratio results in the clotting of the oil and powder mixture. However, using as much as 7.5% oil (by weight of the rice), an oily, greasy surface product was obtained, which was not quite appropriate for packaging or applying
20 further layers of oil. Thus 2.1 to 3% oil content is highly preferred. Below 2% of oil the rice product will be rather dry.

In a further preferred embodiment of the invention the application of the powdered food preparation or mixture is carried out preferably in a short period of time and/or in a reduced humidity environment, more preferably below 50 ERH%
25 (Equilibrium Relative Humidity) or, if desired, below 30 ERH%. The high hygroscopicity of some food powders, such as tomato powder, is well known for a person skilled in the art. Some powdered food preparations, mostly of plant origin such as fruit powders, are extremely hygroscopic. In the knowledge of the present disclosure, the skilled person can readily determine the sufficient or the optimal
30 humidity conditions also in the case of powdered food preparations not explicitly described in the Examples below.

According to a further preferred embodiment of the invention the oil is applied to the surface of rice by dripping or spraying, while the grains are rotated

or whirled slowly. This step can be carried out preferably in a low speed, stainless steel mixing worm apparatus suitable for coating.

In a further preferred embodiment of the invention the used powdered food mixture is prepared in an appropriate grinding or milling apparatus from materials of plant origin comprising at most 10% moisture, preferably from dried vegetables, dried fruits or fruit powders and optionally from spices, instant preparations or mixtures thereof prepared in advance; or from edible materials of animal origin, preferably from dried meat extracts, from extracts of meat based products (e.g. broth extract); and/or from various nutritive supplements, preferably from vitamins and/or minerals. Thereafter, a fine, low particle size powder mixture is prepared in an appropriate mixing apparatus. The powder mixture used in the invention comprises low fat components, i.e. its fat content is less than 5%, preferably less than 1%, more preferably less than 0.5%.

During the application of the powdered food mixture, the rice grains are mixed preferably at a low rotating speed, more preferably at 30 to 50 rpm, preferably for 2 to 20 minutes, more preferably for 5 to 10 minutes.

After the rice has been coated with oil and various powdered food mixtures, the raw rice product can be supplemented by dried food pieces or slices of plant or animal origin. The ratio of the dried food pieces or slices is 1.0 to 15% by weight of the rice and their moisture content is not more than 10%, preferably about 4 to 6 %.

The slices or pieces can be of diverse shape. In one embodiment, the size of the pieces or slices is smaller than 20 mm x 10 mm x 10 mm, preferably 10 mm x 10 mm x 2 mm, i.e. the slices are rather "flat" or "leafy", optionally flake like, and their thickness is preferably less than 2 mm, more preferably less than 1 mm. These shapes or size intervals can be applied e.g. for pieces of dried mushroom, meat or vegetables, e.g. for dried tomato, paprika, celery, onion, leek etc. In an other embodiment, the size of the pieces or slices is less than 5 mm x 5 mm x 40 mm, preferably less than 2 mm x 4 mm x 30 mm i.e. the pieces or slices are "thin and lengthy". These shapes or size intervals can be applied e.g. for pieces of dried onion or other vegetables, such as colerape, carrot, beet, white beet, celery, Hungarian turnip, kohlrabi, asparagus etc. The dried vegetables might be or might not be freeze-dried or puffed dried.

Preferably, the dried pieces or slices should be added in a further step, after the application of the powdered food mixture. If the size of the pieces or slices is

appropriate (i.e. their one or two dimensions are sufficiently small, i.e. they are sufficiently "flat" or "thin"), their quantity and moisture content is adequate, and their fat content is low enough, most of them or, preferably, all of them will adhere to or wrap around the surface of rice. If so, the product can be portioned evenly and the portions can be easily controlled. However, the inventive idea is evidently embodied in those rice products in which the dried pieces or slices are only weighed out together with the raw rice product of the invention but are not adhered to it. The addition of the dried pieces or slices is carried out in the same manner as described above for the powdered food preparations and mixtures. The individual parameters (humidity, rotating speed of the mixing worm) depend on the substance, moisture content, pretreatment (e.g. puffing), and consistence (e.g. friable) of the dried food pieces or slices in a way known *per se* or can be readily determined by a skilled person.

In a preferred embodiment of the invention the product obtained is stored and/or packaged under conditions of reduced humidity. Crumbling of the larger dried pieces or slices upon mixing, storage and packaging is acceptable, provided that the size of at least 60% of the whole quantity remains at least half of the original size.

The invention further relates to a raw rice product coated with oil/fat, preferably with mineral oil and/or vegetable oil/fat of eating quality, and comprising powdered food components or mixtures thereof on the surface of the grains.

The raw rice product of the invention comprises raw, husked white rice or partially husked brown rice of a moisture content at most 16%, at least about 9%, and preferably about 12% to about 15%, which is coated with at most 12%, preferably less than 5%, more preferably 2.1 to 3% mineral oil and/or vegetable oil/fat of eating quality or mixture thereof being not susceptible to rancidity and, on their surface the rice grains comprise, depending on the thickness of the oil film layer, at most 20%, preferably about 10%, low fat powdered food preparation or powdered food mixture which has a moisture content at most 10%, preferably at most 6%; a fat content at most 5%, preferably at most 1%, and more preferably at most 0.5%; and a particle size at most 2000 μm , preferably at most 1000 μm , more preferably less than 500 μm , most preferably less than 315 μm .

Preferably, the rice product of the invention comprises a fine particle size, powdered food mixture of a moisture content of at most 10%, prepared from materials of plant origin, preferably from dried vegetables, dried fruits or fruit powders and optionally from spices, instant preparations or mixtures thereof
5 prepared in advance; or from edible materials of animal origin, preferably from dried meat extracts, from extracts of meat based products (e.g. broth extract); and/or from various nutritive supplements, preferably from vitamins and/or minerals and optionally from other, ordinarily used components, e.g. plant seeds. The powdered food mixture can be supplemented by dried vegetable pieces or
10 slices.

In a further preferred embodiment the rice products of the invention are packaged in a reduced humidity environment, preferably below 50 ERH% or, if desired, below 30 ERH%, in a vapourtight, flavourtight, and, if desired, light protecting packaging. Such packaging methods and pack materials are well known
15 in the art. Advantageously, plastic (e.g. polyethylene) or aluminum based pack materials, optionally combined with paper, or other combined foils can be used.

In a highly preferred embodiment of the invention the rice product comprises a mixture of white oil and garlic oil, and a powdered food mixture consisting of spinach powder, salt, optionally iodinated marine salt, sugar, cheese
20 powder, e.g. Parmesan cheese powder, and optionally cheese flavor and a flavor intensifier, e.g. sodium glutamate.

In a further highly preferred embodiment of the invention the rice product comprises a mixture of mineral white oil and paprika oil, and a powdered food mixture consisting of onion powder, salt, optionally iodinated marine salt, sugar,
25 cheese powder, e.g. Parmesan cheese powder, and flavor or flavor intensifier, e.g. sodium glutamate.

According to a further highly preferred embodiment of the invention the rice product comprises a mixture of mineral white oil and paprika oil and a powdered food mixture consisting of onion powder, salt, optionally iodinated marine salt,
30 tomato powder and flavor or flavor intensifier, e.g. sodium glutamate. This product is preferably prepared in an environment characterized by a humidity lower than 50 ERH%, since tomato powder (mixture) and thus the tomato rice product is highly susceptible to the humidity of the air.

In a highly preferred embodiment of the invention any of the above raw rice products may further comprise dried food pieces or slices of plant or animal origin, preferably mushroom, meat and/or vegetable slices or pieces not larger than 20 mm x 10 mm x 10 mm or onion or vegetable slices or pieces not larger than 20 mm x 10 mm x 10 mm. The ratio of the dried food pieces or slices is at most 15% by weight of the rice and their moisture content is at most 10%, preferably about 4 to 6 %. In a particularly preferred embodiment the product comprises dried mushroom ("rice with mushrooms"); dried onion, paprika and tomato ("letcho rice"); or dried meat or meat-ball and spices, e.g. curry ("curry-and-meat rice").

10 In a further highly preferred embodiment of the invention the rice product comprises white oil and a powdered food mixture consisting of milk-powder, crystalline vanilla, chemically stable artificial sweetener (e.g. sodium cyclamate or saccharin), a small quantity of sugar, salt, fruit powder, e.g. instant fruit powder and optionally dried pieces or slices of fruits (e.g. bananas, apples, raisins etc).
15 Contrary to the powdered fruits, fruit pieces might not adhere to the surface of the grains. When dried, instant fruit powders are used, their increased susceptibility to the humidity of the air should be considered.

In a further highly preferred embodiment of the invention the rice product comprises white oil and milk-powder, crystalline vanilla, chemically stable artificial sweetener (e.g. sodium cyclamate or saccharin), a small quantity of sugar, salt and low fat cocoa or chocolate powder.

The rice products of the invention can be used e.g. in the preparation of multicomponent ready-to-use dish/meal compositions. Thus, the rice products can be mixed with various ready-to-eat or semi-finished food products, e.g. with vegetable products, meat products, meat substitutes, sauces, or sauce bases etc.
25 In addition, a product, in which the raw rice product of the invention and the ready-to-eat or semi-finished food products are separated but packaged in the same packaging unit, can readily be prepared.

Thus, the invention also relates to the use of the raw rice product for the preparation of a multicomponent ready-to-use dish/meal compositions, and to a multicomponent, ready-to-use dish/meal composition prepared from the raw rice product of the invention.

It will be apparent for those skilled in the art, that a wide variety of vegetable oils can be used according to the invention, e.g. paprika oil, garlic oil, onion oil,

oleoresins etc. Plant oils are described in several handbooks of the pertinent field such as Gasztonyi K. and Lásztity R (Editors) "Élelmiszer-kémia I" ("Food Chemistry", vol I), Mezőgazda (Publisher), Budapest, 285-289 (1992).

Furthermore, it is obvious that the powdered food preparation of the invention may consist of a wide variety of powders or dried powders of plant origin, e.g. powders made of vegetables, such as spinach, tomato, paprika, carrot, beet, white beet, red beet, celery, parsley, Hubbard squash, onion etc; and powders made of fruits, such as milled dried fruits or instant fruit powders, e.g. powders made of apple, pear, peach, apricot, cherry, sour cherry, kiwi etc. For the preparation of the powdered food mixture or as a component thereof, powdered, preferably milled spices or spice mixtures, e.g. oregano, basil, rosemary, caraway, black pepper, pepper, cinnamon, *Vegeta*, curry etc. can also be readily used.

The raw rice product can be enriched with various vitamins, e.g. fat-soluble vitamins that might be applied to the surface of rice either separately or mixed into the powder mixture. Water-soluble vitamins can be added in such a way that the powdered, dried fruits or vegetables which have been enriched with vitamins, are applied to the surface of the grains. Similarly, the raw rice product of the invention can be supplemented or aromatized by flavors, e.g. natural flavor products or synthetic products identical to them, such as by flavors or aromas of vegetables, onion, garlic, fruits, meat, cheeses etc. The rice products can be enriched also with minerals, micro or trace elements, in a ratio resulting in a wholesome product for the consumer.

Furthermore, the powdered food preparations and mixtures of the invention or components thereof may consist of a wide variety of products of animal origin, e.g. pork extract, beef extract, broth extract e.g. chicken-broth extract etc.

Other food products can also be readily used as components of the powdered food preparations or mixtures such as dried, powdered honey, yeast, garlic etc.

Obviously, for the preparation of the raw rice products of the present invention, several other food products, starting materials, nutritive supplements and food powders of various taste and color can be used besides those specified above, without departing from the scope and spirit of the invention.

The invention is further explained in the Examples below. The Examples, however, are for illustrating the invention and by no means for restricting its scope.

EXAMPLES

Example 1 Rice with spinach (white rice)

Husked white rice (90.5 kg, 13.8% moisture content) is coated with a mixture of white oil (2.17 kg) and garlic oil (0.08 kg). Meanwhile, the powdered food mixture for coating is prepared, as follows:

Spinach powder	3.17 kg
Marine salt (iodinated)	2.22 kg
Sugar	0.45 kg
Powdered Parmezan cheese	0.90 kg
Powdered Parmezan cheese aroma	0.32 kg
Flavour intensifyer: sodium glutamate	0.09 kg.

After weighing, the powder mixture is ground in a so-called Swedish fine grinder apparatus equipped with knives and sieves, homogenized, passed through a separator of a pore size of 315µm. 99% of the ground powder has a particle size below 250 µm.

Prior to further use, the ground powder mixture is stored in a reduced humidity environment, in vapourtight containers. After this the oil-coated rice grains, being rotated in a coating vessel, are slowly dusted with the homogenized, green powder mixture and further mixed for 5 to 10 minutes in order to obtain an even coating on the rice grains.

The coated rice product is stored in vapourtight containers till packaging. The above composition of ingredients results in 100 kg of finished product.

Example 2 Rice with spinach (brown rice)

To obtain 100 kg of finished product, brown rice (90.0 kg, 12.0% moisture content) is coated with a mixture of white oil (2.00 kg) and garlic oil (0.09 kg). Meanwhile, the powdered food mixture for coating is prepared, as follows:

Spinach powder	2.63 kg
Marine salt (iodinated)	2.30 kg
Sugar	0.50 kg
Powdered Parmezan cheese	0.90 kg
Powdered Parmezan cheese aroma	0.40 kg
Flavour intensifyer: sodium glutamate	0.09 kg.

The powdered food mixture is ground, homogenized, applied to the surface of rice, stored and packaged as described in Example 1. Furthermore, the same particle size was used.

Example 3 Rice with spinach

- 5 To obtain 100 kg of finished product, husked rice (80.5 kg, 12.7% moisture content) is coated with a mixture of white oil (7.69 kg) and garlic oil (0.08 kg). Meanwhile, the powdered food mixture for coating is prepared, as follows:

Spinach powder	7.69 kg
Marine salt (iodinated)	2.26 kg
Sugar	0.45 kg
Powdered Parmezan cheese	0.90 kg
Powdered Parmezan cheese aroma	0.41 kg
Flavour intensifier: sodium glutamate	0.10 kg.

- 10 The powdered food mixture is ground, homogenized, and applied to the surface of rice as described in Example 1. The particle size of 99% of the powdered mixture is less than 250 μm . The higher spinach and oil content results in a darker product with a strong spinach taste.

Products comprising spinach powder are less susceptible to changes in humidity than products coated with tomato powder (see Example 5).

Example 4 Rice with onions

- 15 To obtain 100 kg of finished product, husked white rice (91.56 kg, 14.5% moisture content) is coated with a mixture of white mineral oil (1.53 kg) and paprika oil (0.38 kg). Meanwhile, the powdered food mixture for coating is prepared, as follows:

Onion powder	1.00 kg
Marine salt (iodinated)	2.29 kg
Sugar	0.46 kg
Powdered Parmezan cheese	2.75 kg
Flavour intensifier: sodium glutamate	0.09 kg.

- 20 The powdered food mixture is ground, homogenized, applied to the surface of rice and stored as described in Example 1. Furthermore, the same particle size was used. The coated rice product is yellow or orange in color. Paprika oil is used to provide appropriate color and taste. Substituting a paprika oil of higher coloring power for the paprika oil used herein, its quantity can be reduced to below 0.1 kg

paprika oil / 100 kg finished product. The onion flavor can be increased by the addition of 1 to 2% dried onion pieces by weight of the rice.

Example 5 Rice with tomato

To obtain 100 kg of finished product, husked white rice (88.40 kg, 13.0% moisture content) is coated with a mixture of white mineral oil (1.53 kg) and paprika oil (0.38 kg). Meanwhile, the powdered food mixture for coating is prepared, as follows:

Tomato powder	5.30 kg
Marine salt (iodinated)	0.80 kg
Onion powder	0.80 kg
Flavour intensifyer: sodium glutamate	0.09 kg.

The particle size of more than 90% of the powdered mixture is less then 250 μm .

Tomato powders, and thus the above powdered mixture is highly susceptible to the humidity of the air. Therefore, the "rice with tomato" product is prepared by a continuous process in a low humidity environment, most preferably characterized by a humidity lower than 30 ERH%. After grinding and homogenizing the components the surface of the rice is dusted with the mixture and, if possible, the product is packaged immediately.

Here again, a paprika oil of higher coloring value can be used in order to reduce its ratio to 0.1 kg paprika oil / 100 kg product. However, the quantity of the white oil should then be increased accordingly.

Example 6 Fruit-rice

To obtain 100 kg of finished product, husked rice (82-90 kg, 14 % moisture content) is coated with white oil (2.10 kg). Meanwhile, the powdered food mixture for coating is prepared, as follows:

Sugar	1.00 kg
Instant skimmed milk powder	2.85 kg
Salt	0.50 kg
Crystalline vanilla	0.40 kg
Artificial sweetener	0.35 kg
Instant fruit powder	2-10 kg.

In this example only the sweetener, sugar, salt and crystalline vanilla are ground. Grinding of the instant milk powder and fruit powder is unnecessary.

After weighing, the powder mixture is homogenized, then distributed on the surface of the oil-coated rice whirled in the coating vessel. After a further mixing for 5 to 10 minutes an even coating on the rice grains is obtained. The quantity of the instant fruit powder can be varied depending on the flavoring character of the fruit components. As described above, the packaging of the fruit-rice should be vapourtight, flavourtight, and light protecting.

Example 7 Fruit-rice

The fruit-rice product of this example is largely the same as the product described in Example 6. However, instead of instant fruit powder dried raisins and fruit pieces are weighed out and packaged together with the coated rice product in the same packaging unit. Composition of the raisins and fruit ingredients (altogether 10 kg in 100 kg finished product) is as follows:

Dried banana pieces with honey	3.40 kg
Dried apple pieces	2.20 kg
Raisins	4.40 kg.

Example 8 Cocoa-rice

To obtain 100 kg of finished product, husked white rice (92.28 kg, 14.7 % moisture content) is coated with white oil (2.10 kg). Then, the rice grains, while whirled in a coating vessel, are evenly coated with the following powdered food mixture:

Sugar	1.00 kg
Instant skimmed milk powder	2.00 kg
Salt	0.50 kg
Crystalline vanilla	0.14 kg
Artificial sweetener	0.50 kg
Instant cocoa drink powder	2-10 kg.

The packaging of the cocoa-rice is the same as described above.

Example 9 Rice with mushrooms

The oil-coated raw rice can be prepared in accordance with any of the above examples. The powdered food mixture comprising sugar, salt, onion powder, dried parsley and spices can be applied to the surface of the processed rice as disclosed in any of Examples 1 to 4. In the next step pieces of dried mushroom or a mushroom mixture are added separately, using the same conditions. The size of said pieces is at most 20 mm x 10 mm x 10 mm.

Preferably, the composition of the product is the following:

Rice	87.63 kg
Dried mushroom	5.00 kg
Sugar	0.44 kg
Salt	2.20 kg
White oil	2.20 kg
Spice mixture (<i>Kotányi</i>)	1.14 kg
Onion powder	0.95 kg
Dried parsley	0.44 kg
	<hr/> 100.00 kg

Example 10 "Letcho-rice"

The oil-coated raw rice can be prepared according to any of the above examples. The powdered food mixture comprising sugar, salt, tomato powder, cheese powder, onion powder, and spices can be applied to the surface of the
 5 processed rice as disclosed in Example 5. In the next step pieces of dried paprika, onion and tomato are added separately, using the same conditions. The size of said pieces is at most 20 mm x 10 mm x 10 mm. Preferably, said pieces are "leafy" with a thickness of less than 1 mm.

10 Preferably, the composition of the product is the following:

Rice	84.30 kg
White oil	0.76 kg
Paprika oil	1.52 kg
Tomato powder	1.91 kg
Parmezan cheese powder (<i>FiS</i>)	0.95 kg
Salt	2.10 kg
Sugar	0.76 kg
Onion powder	0.76 kg
Sodium glutamate	0.09 kg
Dried paprika	2.34 kg
Dried onion	2.30 kg
Dried tomato	2.20 kg
	<hr/> 100.00 kg

The invention and its preferred embodiments were described above in detail.

In the process used by the present Applicants the coloring and flavoring components and dried materials of plant or animal origin can be applied to the surface of husked or partially husked raw rice without additives, using a low cost and simple method at normal temperatures.

It should be emphasized that the use of raw rice as starting material is highly advantageous compared with the use of parboiled or instant rice. Preparation of the latter requires expensive and energy consuming methods, i.e. steamed parboiling and long term (cca. 16 hours) gradual drying to prevent crumbling or breaking of the grains. As a result, several useful constituents of the rice, such as fibres, vitamins, flavors etc. will decompose. For this reason, and because whitening additives are needed to preserve the original color, the instant/parboiled rice is less wholesome and its nutritive value is lower, consequently less popular among consumers compared to raw rice. Since parboiled rice processed this way is more friable, the loss of grains due to crumbling will be high (cca. 30%) as compared with the negligible loss found using the process of the invention. Furthermore, a product made of parboiled rice, though really fast to prepare, can easily be overcooked.

Using the process of the invention a durable coating of rice grains can be obtained, provided that the starting materials have an appropriate moisture content, particle size distribution and fat content, the oil and the powder mixtures are applied in the ratios as disclosed in the description. Preferably the finished product is packaged in flavortight, vapourtight and light protecting materials. A further advantage of the process of the invention is that the ratio of the resulting crumbled grains is at most 10% as compared to the starting rice material. (The rice used as starting material should be of an "A" quality husked rice according to the Hungarian directive "MÉ 2-61" or an equivalent thereof, comprising at most 1.5% fine debris and at most 9% coarse debris.)

The invention can be used for the preparation of new food products that in turn can be used to prepare tasty rice dishes, e.g. one-course dishes or fast rice garnishes of higher nutritive value compared with rice based dishes of the art. The raw rice products and "one-course rice dishes" can be used advantageously as fast foods or delicacy.

The product range based on coated, flavored raw rice products of the invention can be further extended, if needed.

CLAIMS

1. A process for preparing a raw rice product coated with powdered food components comprising the steps of

- coating raw rice of a moisture content at most 16% with eating quality mineral oil and/or vegetable oil/fat; and
- applying a low fat powdered food preparation or food mixture to the surface of the coated rice grains, wherein the food preparation or mixture has a moisture content lower than that of the rice and its particle size is at most 2000 μm .

2. Process of claim 1 wherein the rice is raw, husked white rice or partially husked brown rice with at most 16% and at least about 9%, preferably about 12% to about 15% moisture content, the surface of which is coated with at most 12%, preferably less than 5%, more preferably 2.1 to 3% eating quality mineral oil and/or vegetable oil or mixture thereof being unsusceptible to rancidity,

and, depending on the thickness of the oil film layer, at most 20%, preferably about 10%, low fat powdered food mixture is applied to the oil-coated rice grains, wherein the powdered food mixture has a moisture content at most 10%, preferably at most 6% and a fat content below 5%, preferably below 1%, more preferably below 0.5% and its particle size is at most 2000 μm , preferably at most 1000 μm , more preferably less than 500 μm , most preferably less than 315 μm ,

and which process optionally comprises a further step of preparing the powdered food mixture by mixing, grinding and/or homogenizing its components before the application of the mixture to the rice.

3. Process of any of claims 1 or 2 wherein the application of the powdered food preparation or mixture is carried out in a short period of time and/or in a reduced humidity environment, preferably below 50 ERH% or, if desired, below 30 ERH%.

4. Process of any of claims 1 to 3 wherein the oil is applied to the surface of rice, while the grains are rotated or whirled slowly, by dripping or spraying, preferred in a low speed, stainless steel coating vessel, preferably in a mixing worm apparatus.

5. Process of any of claims 1 to 4 wherein

– the powdered food mixture is prepared in an appropriate grinding or milling apparatus, from any of the following: materials of plant origin comprising at most 10% moisture, preferably dried vegetables, dried fruits, instant fruit powders; spices, instant preparations or mixtures thereof prepared in advance; edible materials of animal origin, preferably dried meat extracts, extracts of meat based products (e.g. broth extract); various nutritive supplements, preferably vitamins and/or minerals, and

– a fine, low particle size powder mixture is prepared in an appropriate mixing apparatus.

10 6. Process of any of claims 1 to 5 wherein during the application of the powdered food mixture the rice grains are whirled preferably at a low rotating speed, more preferably at 30 to 50 rpm, preferably for 2 to 20 minutes, more preferably for 5 to 10 minutes.

15 7. Process of any of claims 1 to 6 wherein the raw rice product is stored and/or packaged in a reduced humidity environment, preferably below 50 ERH%, or, if desired below 30 ERH%.

8. Process of any of claims 1 to 6 wherein, preferably in a further step carried out as defined in claim 6 or 7, the raw rice product is supplemented by dried food pieces or slices of plant or animal origin,

20 preferably by dried pieces of mushroom, meat or vegetables the size of which are smaller than 20 mm x 10 mm x 10 mm, or by dried pieces of onion or other vegetables, the size of which is smaller than 5 mm x 5 mm x 40 mm,

in a ratio at most 15% by weight of the rice,

25 wherein the moisture content of the dried pieces or slices is not more than 10%, preferably about 4 to 6 %.

9. Raw rice product coated with oil/fat, preferably with mineral oil and/or vegetable oil/fat of eating quality, and comprising powdered food preparation or food mixture on the surface of the grains.

30 10. Raw rice product of claim 9 comprising raw, husked white rice or partially husked brown rice of a moisture content at most 16%, at least about 9%, and preferably about 12% to about 15%, the surface of which is coated with at most 12%, preferably less than 5%, more preferably 2.1 to 3% mineral oil and/or vegetable oil/fat of eating quality or mixture thereof being not susceptible to rancidity and, on the surface of the grains, depending on the thickness of the oil

film layer, at most 20%, preferably about 10%, low fat powdered food preparation or powdered food mixture,

wherein the powdered food preparation or powdered food mixture has a moisture content at most 10%, preferably at most 6% and a fat content at most 5%, preferably at most 1%, more preferably at most 0.5%; and its particle size is at most 2000 μm , preferably at most 1000 μm , more preferably less than 500 μm , most preferably less than 315 μm .

11. Raw rice product of any of claims 9 or 10 comprising a fine particle size, powdered food mixture of a moisture content at most 10%, prepared from any of the following: materials of plant origin, preferably dried vegetables, dried fruits or fruit powders; spices, instant preparations or mixtures thereof prepared in advance; edible materials of animal origin, preferably dried meat extracts, extracts of meat based products (e.g. broth extract); various nutritive supplements, preferably vitamins and/or minerals.

12. Raw rice product of any of claims 9 to 10, which is packaged in a reduced humidity environment, preferably below 50 ERH% or, if desired, below 30 ERH%, in a vapourtight, flavourtight, and, if desired, light protecting packaging.

13. Raw rice product of any of claims 9 to 12 further comprising, in a ratio at most 15% by weight of the rice, dried food pieces or slices of plant or animal origin,

preferably dried pieces of mushroom, meat or vegetables the size of which are smaller than 20 mm x 10 mm x 10 mm, or dried pieces of onion or other vegetables, the size of which is smaller than 5 mm x 5 mm x 40 mm,

wherein the moisture content of the dried pieces or slices is not more than 10%, preferably about 4 to 6 %.

14. Use of the raw rice product of any of claims 9 to 13 in the preparation of multicomponent ready-to-use dish/meal compositions.

15. Multicomponent, ready-to-use dish/meal composition prepared by using the raw rice product of any of claims 9 to 13.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/HU 00/00046

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A23L1/182 A23P1/08

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A23L A23P

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 767 636 A (RAMOS HECTOR V ET AL) 30 August 1988 (1988-08-30) cited in the application the whole document	1,2,4-6, 8-11, 13-15
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☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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- *Z* document member of the same patent family

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INTERNATIONAL SEARCH REPORT

Information on patent family members

In International Application No

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